MAQTQGTRRKVCYYYDGDVGNYYYGQGHPMKPHRIRMTHNLLLN

YGLYRKMEIYRPHKANAEEMTKYHSDDYIKFLRSIRPDNMSEYSKQMQRFNVGEDCPV

FDGLFEFCQLSTGGSVASAVKLNKQQTDIAVNWAGGLHHAKKSEASGFCYVNDIVLAI

LELLKYHQRVLYIDIDIHHGDGVEEAFYTTDRVMTVSFHKYGEYFPGTGDLRDIGAGK

GKYYAVNYPLRDGIDDESYEAIFKPVMSKVMEMFQPSAVVLQCGSDSLSGDRLGCFNL

TIKGHAKCVEFVKSFNLPMLMLGGGGYTIRNVARCWTYETAVALDTEIPNELPYNDYF

EYFGPDFKLHISPSNMTNQNTNEYLEKIKQRLFENLRMLPHAPGVQMQAIPEDAIPEE

SGDEDEDDPDKRISICSSDKRIACEEEFSDSEEEGEGGRKNSSNFKKAKRVKTEDEKE

KDPEEKKEVTEEEKTKEEKPEAKGVKEEVKLA (SEQ ID NO:1)

FIGURE 1A

```
   1 atgtctgggg tctctgcccg ctggtgctgc tgtctcccac tcggtcatcc tgagaacaca
  61 gcctgagcgt ctctgtcact cggggtagac cacgcgggga ggcgagcaag atggcgcaga
 121 cgcagggcac ccggaggaaa gtctgttact actacgacgg ggatgttgga aattactatt
 181 atggacaagg ccacccaatg aagcctcacc gaatccgcat gactcataat ttgctgctca
 241 actatggtct ctaccgaaaa atggaaatct atcgccctca caaagccaat gctgaggaga
 301 tgaccaagta ccacagcgat gactacatta aattcttgcg ctccatccgt ccagataaca
 361 tgtcggagta cagcaagcag atgcagagat tcaacgttgg tgaggactgt ccagtattcg
 421 atggcctgtt tgagttctgt cagttgtcta ctggtggttc tgtggcaagt gctgtgaaac
 481 ttaataagca gcagacggac atcgctgtga attgggctgg gggcctgcac catgcaaaga
 541 agtccgaggc atctggcttc tgttacgtca atgatatcgt cttggccatc ctggaactgc
 601 taaagtatca ccagagggtg ctgtacattg acattgatat tcaccatggt gacggcgtgg
 661 aagaggcctt ctacaccacg gaccgggtca tgactgtgtc ctttcataag tatggagagt
 721 acttcccagg aactggggac ctacgggata tcgggggctgg caaaggcaag tattatgctg
 781 ttaactaccc gctccgagac gggattgatg acgagtccta tgaggccatt ttcaagccgg
 841 tcatgtccaa agtaatggag atgttccagc ctagtgcggt ggtcttacag tgtggctcag
 901 actccctatc tggggatcgg ttaggttgct tcaatctaac tatcaaagca cacgccaagt
 961 gtgtggaatt tgtcaagagc tttaacctgc ctatgctgat gctgggagcc ggtggttaca
1021 ccattcgtaa cgttgcccgg tgctggacat atgagacagc tgtggccctg gatacggaga
1081 tccctaatga gcttccatac aatgactact ttgaatactt ggaccagat ttcaagctcc
1141 acatcagtcc ttccaatatg actaaccaga acacgaatga gtacctggag aagatcaaac
1201 agcgactgtt tgagaacctt agaatgctgc cgcacgcacc tgggtccaa atgcaggcga
1261 ttcctgagga cgccatccct gaggagagtg gcgatgagga cgaagacgac cctgacaagc
1321 gcatctcgat ctgctcctct gacaaacgaa ttgcctgtga ggaagagttc tccgattctg
1381 aagaggaggg agagggggggc cgcaagaact cttccaactt caaaaaagcc aagagagtca
1441 aaacagagga tgaaaaagag aaagacccag aggagaagaa agaagtcacc gaagaggaga
1501 aaaccaagga ggagaagcca gaagccaaag gggtcaagga ggaggtcaag ttggcctgaa
1561 tggacctctc cagctctggc ttcctgctga gtccctcacg tttctttccc c (SEQ ID NO:2)
```

FIGURE 1B

MAYSQGGGKKKVCYYYDGDIGNYYYGQGHPMKPHRIRMTHNLLL

NYGLYRKMEIYRPHKATAEEMTKYHSDEYIKFLRSIRPDNMSEYSKQMHIFNVGEDCP

AFDGLFEFCQLSTGGSVAGAVKLNRQQTDMAVNWAGGLHHAKKYEASGFCYVNDIVLA

ILELLKYHQRVLYIDIDIHHGDGVEEAFYTTDRVMTVSFHKYGEYFPGTGDLRDIGAG

KGKYYAVNFPMCDGIDDESYGQIFKPIISKVMEMYQPSAVVLQCGADSLSGDRLGCFN

LTVKGHAKCVEVVKTFNLPLLMLGGGGYTIRNVARCWTYETAVALDCEIPNELPYNDY

FEYFGPDFKLHISPSNMTNQNTPEYMEKIKQRLFENLRMLPHAPGVQMQAIPEDAVHE

DSGDEDGEDPDKRISIRASDKRIACDEEFSDSEDEGEGGRRNVADHKKGAKKARIEED

KKETEDKKTDVKEEDKSKDNSGEKTDTKGTKSEQLSNP (SEQ ID NO:3)

FIGURE 2A

```
   1 cgccgagctt tcggcacctc tgccgggtgg taccgagcct tcccggcgcc ccctcctctc
  61 ctcccaccgg cctgcccttc cccgcgggac tatcgccccc acgtttccct cagcccttt
 121 ctctcccggc cgagccgcgg cggcagcagc agcagcagca gcagcaggag gaggagcccg
 181 gtggcggcgg tggccgggga gcccatggcg tacagtcaag gaggcggcaa aaaaaaagtc
 241 tgctactact acgacggtga tattggaaat tattattatg gacagggtca tcccatgaag
 301 cctcatagaa tccgcatgac ccataacttg ctgttaaatt atggcttata cagaaaaatg
 361 gaaatatata ggccccataa agccactgcc gaagaaatga caaaatatca cagtgatgag
 421 tatatcaaat ttctacggtc aataagacca gataacatgt ctgagtatag taagcagatg
 481 catatattta atgttgggaga agattgtcca gcgtttgatg gactctttga gttttgtcag
 541 ctctcaactg gcggttcagt tgctggagct gtgaagttaa accgacaaca gactgatatg
 601 gctgttaatt gggctggagg attacatcat gctaagaaat acgaagcatc aggatcctgt
 661 tacgttaatg atattgtgct tgccatcctt gaattactaa agtatcatca gagagtctta
 721 tatattgata tagatattca tcatggtgat ggtgttgaag aagctttta tacaacagat
 781 cgtgtaatga cggtatcatt ccataaaat ggggaatact ttcctggcac aggagacttg
 841 agggatattg gtgctggaaa aggcaaatac tatgctgtca attttccaat gtgtgatggt
 901 atagatgatg agtcatatgg gcagatattt aagcctatta tctcaaaggt gatggagatg
 961 tatcaaccta gtgctgtggt attacagtgt ggtgcagact cattatctgg tgatagactg
1021 ggttgtttca atctaacagt caaaggtcat gctaaatgtg tagaagttgt aaaaacttt
1081 aacttaccat tactgatgct tggaggaggt ggctacacaa tccgtaatgt tgctcgatgt
1141 tggacatatg agactgcagt tgcccttgat tgtgagattc ccaatgagtt gccatataat
1201 gattactttg agtattttgg accagacttc aaactgcata ttagtccttc aaacatgaca
1261 aaccagaaca ctccagaata tatggaaaag ataaaacagc gtttgtttga aaatttgcgc
1321 atgttaccttc atgcacctgg tgtccagatg caagctattc cagaagatgc tgttcatgaa
1381 gacagtggag atgaagatgg agaagatcca gacaagagaa tttctattcg agcatcagac
1441 aagcggatag cttgtgatga agaattctca gattctgagg atgaaggaga aggaggtcga
1501 agaaatgtgg ctgatcataa gaaaggagca aagaaagcta gaattgaaca agataagaaa
1561 gaaacagagg acaaaaaaac agacgttaag gaagaagata aatccaagga caacagtggt
1621 gaaaaaacag ataccaaagg aaccaaatca gaacagctca gcaacccctg aatttgacag
1681 tctcaccaat ttcagaaaat cattaaaaag aaaatattca aacgaaaatg ttttcttttt
1741 gaagacttct ggcttcattt tatactactt tggcatgcac tctatttatt ttcaaatggg
1801 actttttcgt tctttgtttt ctgggcaagt tttattgtga gatttttctaa ttatgaagca
1861 aaatttcttt tctccaccat gctttatgtg atagtattta aaattgatgt gagttattat
1921 gtcaaaaaaa ctgatctatt aaagaagtaa ttggcctttc tgagctgaaa aaaaaaaaaa
1981 aaaag (SEQ ID NO:4)
```

FIGURE 2B

MAKTVAYFYDPDVGNFHYGAGHPMKPHRLALTHSLVLHYGLYKK

MIVFKPYQASQHDMCRFHSEDYIDFLQRVSPTNMQGFTKSLNAFNVGDDCPVFPGLFE

FCSRYTGASLQGATQLNNKICDIAINWAGGLHHAKKFEASGFCYVNDIVIGILELLKY

HPRVLYIDIDIHHGDGVQEAFYLTDRVMTVSFHKYGNYFFPGTGDMYEVGAESGRYYC

LNVPLRDGIDDQSYKHLFQPVINQVVDFYQPTCIVLQCGADSLGCDRLGCFNLSIRGH

GECVEYVKSFNIPLLVLGGGGYTVRNVARCWTYETSLLVEEAISEELPYSEYFEYFAP

DFTLHPDVSTRIENQNSRQYLDQIRQTIFENLKMLNHAPSVQIHDVPADLLTYDRTDE

ADAEERGPEENYSRPEAPNEFYDGDHDNDKESDVEI (SEQ ID NO:5)

FIGURE 3A

```
   1 ggaattcgcg gccgcggcgg gcgcgggagg tgcggggcct gctcccgccg gcaccatggc
  61 caagaccgtg gcctatttct acgaccccga cgtgggcaac ttccactacg gagctggaca
 121 ccctatgaag ccccatcgcc tggcattgac ccatagcctg gtcctgcatt acggtctcta
 181 taagaagatg atcgtcttca agccatacca ggcctcccaa catgacatgt gccgcttcca
 241 ctccgaggac tacattgact tcctgcagag agtcagcccc accaatatgc aaggcttcac
 301 caagagtctt aatgccttca acgtaggcga tgactgccca gtgtttcccg ggctccttga
 361 gttctgctcg cgttacacag gcgcatctct gcaaggagca acccagctga caacaagat
 421 ctgtgatatt gccattaact gggctggtgg tctgcaccat gccaagaagt ttgaggcctc
 481 tggcttctgc tatgtcaacg acattgtgat tggcatcctg gagctgctca agtaccaccc
 541 tcgggtgctc tacattgaca ttgacatcca ccatggtgac ggggttcaag aagctttcta
 601 cctcactgac cgggtcatga cggtgtcctt ccacaaatac ggaaattact tcttccctgg
 661 cacaggtgac atgtatgaag tcggggcaga gagtggccgc tactactgtc tgaacgtgcc
 721 cctgcgggat ggcattgatg accagagtta caagcacctt ttccagccgg ttatcaacca
 781 ggtagtggac ttctaccaac ccacgtgcat tgtgctccag tgtggagctg actctctggg
 841 ctgtgatcga ttgggctgct ttaacctcag catccgaggg catggggaat ccgttgaata
 901 tgtcaagagc ttcaatatcc ctctactcgt gctgggtggt ggtggttata ctgtccgaaa
 961 tgttgcccgc tgctggacat atgagacatc gctgctggta gaagaggcca ttagtgagga
1021 gcttccctat agtgaatact tcgagtactt tgccccagac ttcacacttc atccagatgt
1081 cagcaccgc atcgagaatc agaactcacg ccagtatctg gaccagatcc gccagacaat
1141 ctttgaaaac ctgaagatgc tgaaccatgc acctagtgtc cagattcatg acgtgcctgc
1201 agacctcctg acctatgaca ggactgatga ggctgatgca gaggagaggg gtcctgagga
1261 gaactatagc aggccagagg cacccaatga gttctatgat ggagaccatg acaatgacaa
1321 ggaaagcgat gtggagattt aagagtggct tgggatgctg tgtcccaagg aatttctttt
1381 caccttcttg gaagggctgga gggaaaagga gtggctccta gagtcctggg ggtcacccca
1441 ggggcttttg ctgactctgg gaaagagtct ggagaccaca tttggttctc gaaccatcta
1501 cctgcttttc ctctctctcc caaggactga caatggtacc tattagggat gagatacaga
1561 caaggatagc tatctgggac attattggca gtgggccctg gaggcagtcc ctagcccccc
1621 ttgcccctta tttcttccct gcttccctcg acccagaga ttttgagggg atgaacgggt
1681 agacaaggac tgagattgcc tctgacttcc tcctcccctg ggttctgacc ttcttcctcc
1741 ccttgcttcc agggaagatg aagagagaga gatttggaag gggctctggc tccctaacac
1801 ctgaatccca gatgatggga agtatgtttt caagtgtggg gaggatatga aaatgttctg
1861 ttctcacttt tggctttatg tccattttac cactgttttt atccaataaa ctaagtcggt
1921 atttttgta ccttgatgg tttagcggcc gcgc (SEG ID NO: 6)
```

FIGURE 3B

MLAMKHQQELLEHQRKLERHRQEQELEKQHREQKLQQLKNKEKG

KESAVASTEVKMKLQEFVLNKKKALAHRNLNHCISSDPRYWYGKTQHSSLDQSSPPQS

GVSTSYNHPVLGMYDAKDDFPLRKTASEPNLKLRSRLKQKVAERRSSPLLRRKDGPVV

TALKKRPLDVTDSACSSAPGSGPSSPNNSSGSVSAENGIAPAVPSIPAETSLAHRLVA

REGSAAPLPLYTSPSLPNITLGLPATGPSAGTAGQQDTERLTLPALQQRLSLFPGTHL

TPYLSTSPLERDGGAAHSPLLQHMVLLEQPPAQAPLVTGLGALPLHAQSLVGADRVSP

SIHKLRQHRPLGRTQSAPLPQNAQALQHLVIQQQHQQFLEKHKQQFQQQQLQMNKIIP

KPSEPARQPESHPEETEEELREHQALLDEPYLDRLPGQKEAHAQAGVQVKQEPIESDE

EEAEPPREVEPGQRQPSEQELLFRQQALLLEQQRIHQLRNYQASMEAAGIPVSFGGHR

PLSRAQSSPASATFPVSVQEPPTKPRFTTGLVYDTLMLKHQCTCGSSSSHPEHAGRIQ

SIWSRLQETGLRGKCECIRGRKATLEELQTVHSEAHTLLYGTNPLNRQKLDSKKLLGS

LASVFVRLPCGGVGVDSDTIWNEVHSAGAARLAVGCVVELVFKVATGELKNGFAVVRP

PGHHAEESTPMGFCYFNSVAVAAKLLQQRLSVSKILIVDWDVHHGNGTQQAFYSDPSV

LYMSLHRYDDGNFFPGSGAPDEVGTGPGVGFNVNMAFTGGLDPPMGDAEYLAAFRTVV

MPIASEFAPDVVLVSSGFDAVEGHPTPLGGYNLSARCFGYLTKQLMGLAGGRIVLALE

GGHDLTAICDASEACVSALLGNELDPLPEKVLQQRPNANAVRSMEKVMEIHSKYWRCL

QRTTSTAGRSLIEAQTCENEEAETVTAMASLSVGVKPAEKRPDEEPMEEEPPL (SEQ ID NO:7)

FIGURE 4A

```
   1 ggaggttgtg gggccgccgc cgcggagcac cgtccccgcc gccgcccgag cccgagcccg
  61 agcccgcgca cccgcccgcg ccgccgccgc cgccgcccga acagcctccc agcctggcgc
 121 cccggcggcg ccgtggccgc gtcccggctg tcgccgcccg agcccgagcc cgcgcgccgg
 181 cgggtggcgg cgcaggctga ggagatgcgg cgcggagcgc cggagcaggg ctagagccgg
 241 ccgccgccgc ccgccgcggt aagcgcagcc ccggcccggc gcccgcgggc cattgtccgc
 301 cgccgcccc gcgccccgcg cagcctgcag gccttggagc ccgcggcagg tggacgccgc
 361 cggtccacac ccgccccgcg cgcggccgtg ggaggcgggg gccagcgctg gccgcgcgcc
 421 gtgggacccg ccggtcccca gggccgcccg gcccttctg gacctttcca cccgcgccgc
 481 gaggcggctt cgcccgccgg ggcgggggcg cggggtggg cacggcaggc agcggcgccg
 541 tctcccggtg cggggcccgc gcccccgag caggttcatc tgcagaagcc agcggacgcc
 601 tctgttcaac ttgtgggtta cctggctcat gagaccttgc cggcgaggct cggcgcttga
 661 acgtctgtga cccagccctc accgtccgg tacttgtatg tgttggtggg agtttggagc
 721 tcgttggagc tatcgtttcc gtggaaattt tgagccattt cgaatcactt aaaggagtgg
 781 acattgctag caatgagctc ccaaagccat ccagatggac tttctggccg agaccagcca
 841 gtggagctgc tgaatcctgc ccgcgtgaac cacatgccca gcacggtgga tgtggccacg
 901 gcgctgcctc tgcaagtggc cccctcggca gtgccatgg acctgcgcct ggaccaccag
 961 ttctcactgc ctgtgcagga gccggccctg cgggagcagc agctgcagca ggagctcctg
1021 gcgctcaagc agaagcagca gatccagagg cagatcctca tcgctgagtt ccagaggcag
1081 cacgagcagc tctcccggca gcacgaggcg cagctccacg agcacatcaa gcaataacag
1141 gagatgctgg ccatgaagca ccagcaggag ctgctggaac accagcggaa gctggagagg
1201 caccgccagg agcaggagct ggagaagcag caccgggagc agaagctgca gcagctcaac
1261 aacaaggaga agggcaaaga gagtgccgtg gccagcacag aagtgaagat gaagttacaa
1321 gaatttgtcc tcaataaaaa gaaggcgctg gcccaccgga atctgaacca ctgcatttcc
1381 agcgacccctc gctactggta cgggaaaacg cagcacagtt cccttgacca gagttctcca
1441 ccccagagcg gagtgtcgac ctcctataac caccggtcc tggaatgta cgacgccaaa
1501 gatgacttcc ctcttaggaa aacagcttct gaaccgaatc tgaaattacg gtccaggcta
1561 aagcagaaag tggccgaaag acggagcagc ccctgttac gcaggaaaga cgggccagtg
1621 gtcactgctc taaaaaagcg tccgttggat gtcacagact ccgcgtgcag cagcgcccca
1681 ggctccggac ccagctcacc caacaacagc tccgggagcg tcagcgcgga gaacggtatc
1741 gcgcccgccg tccccagcat cccggcggag acgagtttgg cgcacagact tgtggcacga
1801 gaaggctcgg ccgctccact tcccctctac acatcgccat ccttgcccaa catcacgctg
1861 ggcctgcctg ccaccggccc ctctgcgggc acggcgggcc agcaggacac cgagagactc
1921 acccttcccg ccctccagca gaggctctcc ctttcccg gcacccacct cactccctac
1981 ctgagcacct cgcccttgga gcgggacgga ggggcagcgc acagccctct tctgcagcac
2041 atggtcttac tggagcagcc accggcacaa gcacccctcg tcacaggcct gggagcactg
2101 cccctccacg cacagtcctt ggttggtgca gaccgggtgt ccccatccat ccacaagctg
2161 cggcagcacc gcccactggg gcggacccag tcggccccgc tgccccagaa cgcccaggct
2221 ctgcagcacc tggtcatcca gcagcagcat cagcagtttc tggagaaaca caagcagcag
2281 ttccagcagc agcaactgca gatgaacaag atcatcccca gccaagcga gccagccgg
2341 cagccggaga gccacccgga ggagacggag gaggagctcc gtgagcacca ggctctgctg
2401 gacgagccct acctggaccg gctgccgggg cagaaggagg cgcacgcaca ggccggcgtg
2461 caggtgaagc aggagcccat tgagagcgat gaggaagagg cagagccccc acgggaggtg
2521 gagccgggcc agcgccagcc cagtgagcag gagctgctct tcagacagca agccctcctg
2581 ctggagcagc agcggatcca ccagctgagg aactaccagg cgtccatgga ggccgccggc
2641 atccccgtgt ccttcggcgg ccacaggcct ctgtcccggg cgcagtcctc accgcgtct
2701 gccacccttcc ccgtgtctgt gcaggagccc cccaccaagc cgaggttcac gacaggcctc
2761 gtgtatgaca cgctgatgct gaagcaccag tgcacctgcg ggagtagcag cagccacccc
2821 gagcacgccg ggaggatcca gagcatctgg tcccgcctgc aggagacggg cctccggggc
2881 aaatgcgagt gcatccgcgg acgcaaggcc accctggaag agctacagag ggtgcactcg
2941 gaagcccaca ccctcctgta tggcacgaac ccctccacc ggcagaaact ggacagtaag
3001 aaacttctag gctcgctcgc ctccgtgttc gtccggctcc cttgcggtgg tgttggggtc
3061 gacagtgaca ccatatggaa cgaggtgcac tcggcggggg cagcccgcct ggctgtgggc
3121 tgcgtggtag agctcgtctt caaggtggcc acaggggagc tgaagaatgg cttgctgtc
3181 gtccgccccc ctggacacca tgcggaggag agcacgccca tgggcttttg ctacttcaac
3241 tccgtggccg tggcagccaa gcttctgcag cagaggttga gcgtgagcaa gatcctcatc
3301 gtggactggg acgtgcacca tggaaacggg acccagcagg ctttctacag cgacctagc
3361 gtcctgtaca tgtccctcca ccgctacgac gatgggaact tcttcccagg cagcggggct
3421 cctgatgagg tgggcacagg gcccggcgtg ggtttcaacg tcaacatggc tttcaccggc
3481 ggcctggacc cccccatggg agacgctgag tacttggcgg ccttcagaac ggtggtcatg
3541 ccgatcgcca gcgagtttgc cccggatgtg gtgctgctgt catcaggctt cgatgccgtg
```

FIGURE 4B (SHEET 1 OF 3)

```
3601 gagggccacc ccaccccctct tggggggctac aacctctccg ccagatgctt cgggtacctg
3661 acgaagcagc tgatgggcct ggctggcggc cggattgtcc tggccctcga gggaggccac
3721 gacctgaccg ccatttgcga cgcctcggaa gcatgtgctt ctgccttgct gggaaacgag
3781 cttgatcctc tcccagaaaa ggtttttacag caaagaccca atgcaaacgc tgtccgttcc
3841 atggagaaag tcatggagat ccacagcaag tactggcgct gcctgcagcg cacaacctcc
3901 acagcggggc gttctctgat cgaggctcag acttgcgaga cgaagaagc cgagacggtc
3961 accgccatgg cctcgctgtc cgtgggcgtg aagcccgccg aaaagagacc agatgaggag
4021 cccatggaag aggagccgcc cctgtagcac tccctcgaag ctgctgttct cttgtctgtc
4081 tgtctctgtc ttgaagctca gccaagaaac tttcccgtgt cacgcctgcg tcccaccgtg
4141 gggctctctt ggagcaccca gggacaccca gcgtgcaaca gccacgggaa gcctttctgc
4201 cgcccaggcc cacaggtctc gagacgcaca tgcacgcctg ggcgtggcag cctcacaggg
4261 aacacgggac agacgaccggc gacgcagga cacacggaca cgcggaagcc aagcacactc
4321 tggcgggtcc cgcaagggac gccgtggaag aaaggagcct gtggcaacag gcggccgagc
4381 tgccgaattc agttgacacg aggcacagaa aacaaatatc aaagatctaa taatacaaaa
4441 caaacttgat taaaactggt gcttaaagtt tattacccac aactccacag tctctgtgta
4501 aaccactcga ctcatcttgt agcttatttt tttttaaag aggacgtctt ctacggctgt
4561 ggcccgcctc tgtgaaccat agcggtgtgc ggcgggggt ctgcacccgg gtggggaca
4621 gaggcacctt taaagaaaac aaaactggac agaaacagga atgtgagctg ggggagctgg
4681 cttgagtttc tcaaaagcca tcggaagatg cgagtttgtg cctttttttt tattgctctg
4741 gtggattttt gtggctgggt tttctgaagt ctgaggaaca atgccttaag aaaaaacaaa
4801 cagcaggaat cggtgggaca gtttcctgtg gccagccagg cctggcagtc ctggcaccgc
4861 gagctggcct gacgcctcaa gcacgggcac cagccgtcat ctccgggcc aggggctgca
4921 gcccggcggt ccctgttttg ctttattgct gtttaagaaa aatggaggcta gttccaaaaa
4981 agtggcaaat cccgttggag gttttgaagt ccaacaaatt ttaaacgaat ccaaagtgtt
5041 ctcacacgtc acatacgatt gagcatctcc atctggtcgt gaagcatgtg gtaggcacac
5101 ttgcagtgtt acgatcggaa tgcttttat taaaagcaag tagcatgaag tattgcttaa
5161 attttaggta caaataaata tatatacgta taatatatat cccatgtat tccaagctaa
5221 gaaacttact tgattcttat gaaatcttga taaaatattt ataatgcatt tatagaaaaa
5281 gtatatatat atatataaaa tgaatgcaga ttgcgaaggt ccctgcaaat ggatggcttg
5341 tgaatttgct ctcaaggtgc ttatggaaag ggatcctgat tgattgaaat tcatgtttt
5401 tcaagctcca gattggctag atttcagatc gccaacacat tcgccactgg gcaactaccc
5461 tacaagtttg tactttcatt ttaattattt tctaacagaa ccgctcccgt ctccaagcct
5521 tcatgcacat atgtacctaa tgagttttta tagcaaagaa tataaacttc ctgttgattt
5581 ttgtatgaat tttttcacaa aaagatcctg aataagcatt gttttatgaa ttttacattt
5641 ctcctcacca tttagcaatt ttctgaatgg taataatgtc taaatctttt tcctttctga
5701 attcttgctt gtacatttttt ttttacccttt caaaggtttt taattatttt tgttttttatt
5761 tttgtacgat gagttttctg cagcgtacag aattgttgct gtcagattct attttcagaa
5821 agtgagagga gggaccgtag gtcttttcgg agtgacacca acgattgtgt cttttcctggt
5881 ctgtcctagg agctgtataa agaagcccag gggctcttt taactctcaa cactagtagt
5941 attacgaggg gtggtgtgtt tttcccctcc gtcgcaagcc cagggagggt tgcttaggat
6001 gcccggccac cctgggaggc ttgccagatg ccggggcag tcagcattaa tgaaactcat
6061 gtttaaactt ctctgaccac atcgtcagga tagaattcta acttgagttt tccaaagacc
6121 ttttgagcat gtcagcaatg catggggcac acgtggggct ctttacccac ttgggtcttt
6181 ccactgcagc cacgtggcca gccctggatt ttggagcctg tggctgcaag gaacccaggg
6241 accttgttg cctggtgaac ctgcagggag ggtatgattg cctgaccagg acagccagtc
6301 tttactcttt ttctcttcaa cagtaactga cagtcacgtt ttactggtaa cttattttcc
6361 agcacatgaa gccaccagtt tcattccaaa gtgtatattg ggttcagact tggggggcaga
6421 agttcagaca caccgtgctc aggagggacc cagagccgag tttcgggtt tggtaaagtt
6481 tacagggtag cttctgaaat taactcaaac ttttgaccaa atgagtgcag attcttggat
6541 tcacttggtc actgggctgc tgatggtcag ctctgagaca gtggttcag agcaggcaga
6601 acggtcttgg gacttgtttg actttcccct ccctggtggc cactctttgc tctgaagccc
6661 agattggcaa gaggagctgg tccattcccc attcatggca cagagcagtg gcaggccca
6721 gctagcaggc tcttctggcc tcctggcct cattctctgc atagccctct ggggatcctg
6781 ccacctgccc tcttaccccg ccgtggctta tggggaggaa tgcatcatct cactttttct
6841 ttttaagcag atgatgggat aacatggact gctcagtggc caggttatca gtgggggggac
6901 ttaattctaa tctcattcaa atggagacgt cctctgcaaa ggcctggcag ggggaggcac
6961 gtttcatctg tcagctcact ccagcttcac aaatgtgctg agagcattac tgtgtagcct
7021 tttccttgaa gacacactcg gctcttctcc acagcaagcg tccagggcag atggcagagg
7081 atctgcctcg gcgtctgcag gcgggaccac gtcagggagg gttccttcat gtgttctccc
7141 tgtgggtcct tggacctta gcctttttct tcctttgcaa aggccttggg ggcactggct
7201 gggagtcagc aagcgagcac tttatatccc tttgagggaa acctgatga cgccactggg
7261 cctcttggcg tctgccctgc cctcgcggct tccgccgtg ccgcagcgtg cccacgtgcc
```

FIGURE 4B (SHEET 2 OF 3)

```
7321 cacgccccac cagcaggcgg ctgtcccgga ggccgtggcc cgctgggact ggccgcccct
7381 ccccagcgtc ccagggctct ggttctggag ggccactttg tcaaggtgtt tcagtttttc
7441 tttacttctt ttgaaaatct gtttgcaagg ggaaggacca tttcgtaatg gtctgacaca
7501 aaagcaagtt tgattttgc agcactagca atggactttg ttgtttttct ttttgatcag
7561 aacattcctt ctttactggt cacagccacg tgctcattcc attcttcttt ttgtagactt
7621 tgggcccacg tgtttatgg gcattgatac atatataaat atatagatat aaatatatat
7681 gaatatattt ttttaagttt cctacacctg gaggttgcat ggactgtacg accggcatga
7741 ctttatactg tatacagatc ttgcacgcca aactcggcag ctttggggaa gaagaaaat
7801 gcctttctgt tcccctctca tgacatttgc agatacaaaa gatggaaatt tttctgtaaa
7861 acaaaacctt gaaggagagg agggcggggga agtttgcgtc ttattgaact tattcttaag
7921 aaattgtact ttttattgta agaaaaataa aaaggactac ttaaacattt gtcatattaa
7981 gaaaaaaagt ttatctagca cttgtgacat accaataata gagtttattg tatttatgtg
8041 gaaacagtgt tctagggaaa ctactcagaa ttcacagtga actgcctgtc tctctcgagt
8101 tgatttggag gaattttgtt ttgtttttgtt ttgtttgttt cctttatct ccttccacgg
8161 gccaggcgag cgccgcccgc cctcactggc cttgtgacgg tttattctga ttgagaactg
8221 ggcggactcg aaagagtccc cttttccgca cagctgtgtt gactttctaa ttacttttag
8281 gtgatgtatg gctaagattt cactttaagc agtcgtgaac tgtgcgagca ctgtggtcta
8341 caattatact ttgcatcgaa aggaaaccat ttcttcattg taacgaagct gagcgtgttc
8401 ttagctcggc ctcactttgt ctctggcatt gattaaaagt ctgctattga aagaaaaag
```
(SEQ ID NO:8

FIGURE 4B (SHEET 3 OF 3)

LRQGGTLTGKFMSTSSIPGCLLGVALEGDGSPHGHASLLQHVLL

LEQARQQSTLIAVPLHGQSPLVTGERVATSMRTVGKLPRHRPLSRTQSSPLPQSPQAL

QQLVMQQQHQQFLEKQKQQQLQLGKILTKTGELPRQPTTHPEETEEELTEQQEVLLGE

GALTMPREGSTESESTQEDLEEEDEEEDGEEEDCIQVKDEEGESGAEEGPDLEEPGA

GYKKLFSDAQPLQPLQVYQAPLSLATVPHQALGRTQSSPAAPGGMKSPPDQPVKHLFT

TGVVYDTFMLKHQCMCGNTHVHPEHAGRIQSIWSRLQETGLLSKCERIRGRKATLDEI

QTVHSEYHTLLYGTSPLNRQKLDSKKLLGPISQKMYAVLPCGGIGVDSDTVWNEMHSS

SAVRMAVGCLLELAFKVAAGELKNGFAIIRPPGHHAEESTAMGFCFFNSVAITAKLLQ

QKLNVGKVLIVDWDIHHGNGTQQAFYNDPSVLYISLHRYDNGNFFPGSGAPEEVGGGP

GVGYNVNVAWTGGVDPPIGDVEYLTAFRTVVMPIAHEFSPDVVLVSAGFDAVEGHLSP

LGGYSVTARCFGHLTRQLMTLAGGRVVLALEGGHDLTAICDASEACVSALLSVELQPL

DEAVLQQKPNINAVATLEKVIEIQSKHWSCVQKFAAGLGRSLREAQAGETEEAETVSA

MALLSVGAEQAQAAAAREHSPRPAEEPMEQEPAL (SEQ ID: NO: 9)

FIGURE 5A

```
   1 ccctgcggca gggtggcacg ctgaccggca agttcatgag cacatcctct attcctggct
  61 gcctgctggg cgtggcactg gagggcgacg ggagccccca cgggcatgcc tccctgctgc
 121 agcatgtgct gttgctggag caggcccggc agcagagcac cctcattgct gtgccactcc
 181 acgggcagtc cccactagtg acgggtgaac gtgtggccac cagcatgcgg acggtaggca
 241 agctcccgcg gcatcggccc ctgagccgca ctcagtcctc accgctgccg cagagtcccc
 301 aggccctgca gcagctggtc atgcaacaac agcaccagca gttcctggag aagcagaagc
 361 agcagcagct acagctgggc aagatcctca ccaagacagg ggagctgccc aggcagccca
 421 ccacccaccc tgaggagaca gaggaggagc tgacggagca gcaggaggtc ttgctggggg
 481 agggagccct gaccatgccc cgggagggct ccacagagag tgagagcaca caggaagacc
 541 tggaggagga ggacgaggaa gaggatgggg aggaggagga ggattgcatc caggttaagg
 601 acgaggaggg cgagagtggt gctgaggagg ggcccgactt ggaggagcct ggtgctggat
 661 acaaaaaact gttctcagat gcccagccgc tgcagccttt gcaggtgtac caggcgcccc
 721 tcagcctggc cactgtgccc caccaggccc tgggccgtac ccagtcctcc cctgctgccc
 781 ctgggggcat gaagagcccc ccagaccagc ccgtcaagca cctcttcacc acaggtgtgg
 841 tctacgacac gttcatgcta aagcaccagt gcatgtgcgg gaacacacac gtgcaccctg
 901 agcatgctgg ccggatccag agcatctggt cccggctgca ggagacaggc ctgcttagca
 961 agtgcgagcg gatccgaggt cgcaaagcca cgctagatga gatccagaca gtgcactctg
1021 aataccacac cctgctctat gggaccagtc ccctcaaccg gcagaagcta gacagcaaga
1091 agttgctcgg ccccatcagc cagaagatgt atgctgtgct gccttgtggg ggcatcgggg
1141 tggacagtga caccgtgtgg aatgagatgc actcctccag tgctgtgcgc atggcagtgg
1201 gctgcctgct ggagctggcc ttcaaggtgg ctgcaggaga gctcaagaat ggatttgcca
1261 tcatccggcc cccaggacac cacgccgagg aatccacagc catgggattc tgcttcttca
1321 actctgtagc catcaccgca aaactcctac agcagaagtt gaacgtgggc aaggtcctca
1381 tcgtggactg ggacattcac catggcaatg gcacccagca ggcgttctat aatgacccct
1441 ctgtgctcta catctctctg catcgctatg acaacgggaa cttctttcca ggctctgggg
1501 ctcctgaaga ggttggtgca ggaccaggcg tggggtacaa tgtgaacgtg gcatggacag
1561 gaggtgtgga cccccccatt ggagacgtgg agtaccttac agccttcagg acagtggtga
1621 tgcccattgc ccacgagttc tcacctgatg tggtcctagt ctccgccggg tttgatgctg
1681 ttgaaggaca tctgtctcct ctgggtggct actctgtcac cgccagatgt tttggccact
1741 tgaccaggca gctgatgacc ctgcaggggg ccgggtggt gctggccctg gagggaggcc
1801 atgacttgac cgccatctgc gatgcctctg aggcttgtgt ctcggctctg ctcagtgtag
1861 agctgcagcc cttggatgag gcagtcttgc agcaaaagcc caacatcaac gcagtggcca
1921 cgctagagaa agtcatcgag atccagagca aacactggag ctgtctgcag aagttcgccg
1981 ctggtctggg ccggtccctg cgagaggccc aagcaggtca gaccgaggag gccgagactc
2041 tgagcgccat ggccttgctg tcggtggggg ccgagcaggc ccagctgcg gcagcccggg
2101 aacacagccc caggccggca gaggagccca tggagcagga gcctgccctg tgacgccccg
2161 gcccccatcc ctctgggctt caccattgtg attttgttta ttttttctat taaaaacaaa
2221 aagtcacaca ttc  (SEQ ID NO:10)
```

FIGURE 5B

```
  1 mtstgqdstt trqrrsrqnp qsppqdssvt skrnikkgav prsipnlaev kkkgkmkklg
 61 qameedlivg lqgmdlnlea ealagtglvl deqlnefhcl wddsfpegpe rlhaikeqli
121 qeglldrcvs fqarfaekee lmlvhsleyi dlmettqymn egelrvladt ydsvylhpns
181 yscaclasgs vlrlvdavlg aeirngmaii rppghhaqhs lmdgycmfnh vavaaryaqq
241 khrirrvliv dwdvhhgqgt qftfdqdpsv lyfsihryeq grfwphlkas nwsttgfgqg
301 qgytinvpwn qvgmrdadyi aaflhvllpv alefqpqlvl vaagfdalqg dpkgemaatp
361 agfaqlthll mglaggklil sleggynlra laegvsaslh tllgdpcpml espgapcrsa
421 qasvscalea lepfwevlvr stetverdnm eednveesee egpweppvlp iltwpvlqsr
481 tglvydqnmm nhcnlwdshh pevpqrilri mcrleelgla grcltltprp ateaelltch
541 saeyvghlra tekmktrelh ressnfdsiy icpstfacaq latgaacrlv eavlsgevln
601 gaavvrppgh haeqdaacgf cffnsvavaa rhaqtisgha lrilivdwdv hhgngtqhmf
661 eddpsvlyvs lhrydhgtff pmgdegassq igraagtgft vnvawngprm gdadylaawh
721 rlvlpiayef npelvlvsag fdaargdplg gcqvspegya hlthllmgla sgriilileg
781 gynltsises maactrsllg dppplltlpr pplsgalasi tetiqvhrry wrslrvmkve
841 dregpssskl vtkkapqpak prlaermttr ekkvleagmg kvtsasfgee stpgqtnset
901 avvaltqdqp seaatggatl aqtiseaaig gamlgqttse eavggatpdq ttseetvgga
961 ildqttseda vggatlgqtt seeavggatl aqtiseaame gatldqttse eapggteliq
1021 tplasstdhq tpptspvqgt tpqispstli gslrtlelgs esqgasesqa pgeenllgea
1081 aggqdmadsm lmqgsrgltd qaifyavtpl pwcphlvavc pipaagldvt qpcgdcgtiq
1141 enwvclscyq vycgryingh mlqhhgnsgh plvlsyidls awcyycqayv hhqalldvkn
1201 iahqnkfged mphph  (SEQ ID NO:11)
```

FIGURE 6A

1 gggcagtccc ctgaggagcg gggctggttg aaacgctagg ggcgggatct ggcggagtgg

61 aagaaccgcg gcaggggcca agcctcctca actatgacct caaccggcca ggattccacc

121 acaaccaggc agcgaagaag taggcagaac ccccagtcgc cccctcagga ctccagtgtc

181 acttcgaagc gaaatattaa aaagggagcc gttcccccgct ctatccccaa tctagcggag

241 gtaaagaaga aaggcaaaat gaagaagctc ggccaagcaa tggaagaaga cctaatcgtg

301 ggactgcaag ggatggatct gaaccttgag gctgaagcac tggctggcac tggcttggtg

361 ttggatgagc agttaaatga attccattgc ctctgggatg acagcttccc ggaaggccct

421 gagcggctcc atgccatcaa ggagcaactg atccaggagg gcctcctaga tcgctgcgtg

481 tcctttcagg cccggtttgc tgaaaaggaa gagctgatgt tggttcacag cctagaatat

541 attgatctga tggaaacaac ccagtacatg aatgagggag aactccgtgt cctagcagac

601 acctacgact cagtttatct gcatccgaac tcatactcct gtgcctgcct ggcctcaggc

661 tctgtcctca ggctggtgga tgcggtcctg ggggctgaga tccggaatgg catggccatc

721 attaggcctc ctggacatca cgcccagcac agtcttatgg atggctattg catgttcaac

781 cacgtggctg tggcagcccg ctatgctcaa cagaaacacc gcatccggag ggtccttatc

841 gtagattggg atgtgcacca cggtcaagga acacagttca ccttcgacca ggaccccagt

901 gtcctctatt tctccatcca ccgctacgag cagggtaggt tctggcccca cctgaaggcc

961 tctaactggt ccaccacagg tttcggccaa ggccaaggat ataccatcaa tgtgccttgg

1021 aaccaggtgg ggatgcggga tgctgactac attgctgctt tcctgcacgt cctgctgcca

1081 gtcgccctcg agtccagcc tcagctggtc ctggtggctg ctggatttga tgccctgcaa

1141 ggggacccca agggtgagat ggccgccact ccggcagggt tcgcccagct aacccacctg

1201 ctcatgggtc tggcaggagg caagctgatc ctgtctctgg agggtggcta caacctccgc

1261 gccctggctg aaggcgtcag tgcttcgctc cacacccttc tgggagaccc ttgccccatg

1321 ctggagtcac ctggtgcccc ctgccggagt gcccaggctt cagtttcctg tgctctggaa

1381 gcccttgagc ccttctggga ggttcttgtg agatcaactg agaccgtgga gagggacaac

1441 atggaggagg acaatgtaga ggagagcgag gaggaaggac cctgggagcc ccctgtgctc

1501 ccaatcctga catggccagt gctacagtct cgcacagggc tggtctatga ccaaaatatg

1561 atgaatcact gcaacttgtg ggacagccac caccctgagg taccccagcg catcttgcgg

1621 atcatgtgcc gtctggagga gctgggcctt gccgggcgct gcctcacccct gacaccgcgc

1681 cctgccacag aggctgagct gctcaccctgt cacagtgctg agtacgtggg tcatctccgg

1741 gccacagaga aaatgaaaac ccgggagctg caccgtgaga gttccaactt tgactccatc

1801 tatatctgcc ccagtacctt cgcctgtgca cagcttgcca ctggcgctgc ctgccgcctg

1861 gtggaggctg tgctctcagg agaggttctg aatggtgctg ctgtggtgcg tccccaggga

1921 caccacgcag agcaggatgc agcttgcggt ttttgctttt tcaactctgt ggctgtggct

1981 gctcgccatg cccagactat cagtgggcat gccctacgga tcctgattgt ggattgggat

2041 gtccaccacg gtaatggaac tcagcacatg tttgaggatg accccagtgt gctatatgtg

2101 tccctgcacc gctatgatca tggcaccttc ttccccatgg gggatgaggg tgccagcagc

2161 cagatcggcc gggctgcggg cacaggcttc accgtcaacg tggcatggaa cgggccccgc

2221 atgggtgatg ctgactacct agctgcctgg catcgcctgg tgcttcccat tgcctacgag

2281 tttaacccag aactggtgct ggtctcagct ggctttgatg ctgcacgggg ggatccgctg

2341 gggggctgcc aggtgtcacc tgagggttat gcccacctca cccacctgct gatgggcctt

2401 gccagtggcc gcattatcct tatcctagag ggtggctata acctgacatc catctcagag

2461 tccatggctg cctgcactcg ctccctcctt ggagacccac caccctgct gaccctgcca

2521 cggcccccac tatcaggggc cctggcctca atcactgaga ccatccaagt ccatcgcaga

2581 tactggcgca gcttacgggt catgaaggta gaagacagag aaggaccctc cagttctaag

Figure 6B (sheet 1 of 2)

2641 ttggtcacca agaaggcacc ccaaccagcc aaacctaggt tagctgagcg gatgaccaca
2701 cgagaaaaga aggttctgga agcaggcatg gggaaagtca cctcggcatc atttggggaa
2761 gagtccactc caggccagac taactcagag acagctgtgg tggccctcac tcaggaccag
2821 ccctcagagg cagccacagg gggagccact ctggcccaga ccatttctga ggcagccatt
2881 gggggagcca tgctgggcca gaccacctca gaggaggctg tcgggggagc cactccggac
2941 cagaccacct cagaggagac tgtgggagga gccattctgg accagaccac ctcagaggat
3001 gctgttgggg gagccacgct gggccagact acctcagagg aggctgtagg aggagctaca
3061 ctggcccaga ccatctcgga ggcagccatg gagggagcca cactggacca gactacgtca
3121 gaggaggctc caggggggcac cgagctgatc caaactcctc tagcctcgag cacagaccac
3181 cagacccccc caacctcacc tgtgcaggga actacacccc agatatctcc cagtacactg
3241 attgggagtc tcaggacctt ggagctaggc agcgaatctc aggggggcctc agaatctcag
3301 gccccaggag aggagaacct actaggagag gcagctggag gtcaggacat ggctgattcg
3361 atgctgatgc agggatctag gggcctcact gatcaggcca tattttatgc tgtgacacca
3421 ctgccctggt gtccccattt ggtggcagta tgccccatac ctgcagcagg cctagacgtg
3481 acccaacctt gtggggactg tggaacaatc caagagaatt gggtgtgtct ctcttgctat
3541 caggtctact gtggtcgtta catcaatggc cacatgctcc aacaccatgg aaattctgga
3601 cacccgctgg tcctcagcta catcgacctg tcagcctggt gttactactg tcaggcctat
3661 gtccaccacc aggctctcct agatgtgaag aacatcgccc accagaacaa gtttggggag
3721 gatatgcccc acccacacta agccccagaa tacggtccct cttcaccttc tgaggcccac
3781 gatagaccag ctgtagctca ttccagcctg taccttggat gaggggtagc ctcccactgc
3841 atcccatcct gaatatcctt gcaactccc caagagtgct tatttaagtg ttaatacttt
3901 taagagaact gcgacgatta attgtggatc tcccccctgcc cattgcctgc ttgaggggca
3961 ccactactcc agcccagaag gaaaggggggg cagctcagtg gccccaagag ggagctgata
4021 tcatgaggat aacattggcg ggaggggagt taactggcag gcatggcaag gttgcatatg
4081 taataaagta caagctgtt (SEQ ID NO. 12)

FIGURE 6B
(Sheet 2 of 2)

1 mdlrvgqrpp vepppeptll alqrpqrlhh hlflaglqqq rsvepmrlsm dtpmpelqvg
61 pqeqelrqll hkdkskrsav assvvkqkla evilkkqqaa lertvhpnsp gipyrtlepl
121 etegatrsml ssflppvpsl psdppehfpl rktvsepnlk lrykpkksle rrknpllrke
181 sappslrrrp aetlgdssps ssstpasgcs spndsehgpn pilgdsdrrt hptlgprgpi
241 lgsphtplfl phglepeagg tlpsrlqpil lldpsgshap lltvpglgpl pfhfaqslmt
301 terlsgsglh wplsrtrsep lppsatappp pgpmqprleq lkthvqvikr sakpsekprl
361 rqipsaedle tdgggpgqvv ddglehrelg hgqpeargpa plqqhpqvll weqqrlagrl
421 prgstgdtvl lplaqgghrp lsraqsspaa paslsapepa sqarvlssse tpartlpftt
481 gliydsvmlk hqcscgdnsr hpehagriqs iwsrlqergl rsqceclrgr kasleelqsv
541 hserhvllyg tnplsrlkld ngklagllaq rmfemlpcgg vgvdtdtiwn elhssnaarw
601 aagsvtdlaf kvasrelkng favvrppghh adhstamgfc ffnsvaiacr qlqqqskask
661 askilivdwd vhhgngtqqt fyqdpsvlyi slhrhddgnf fpgsgavdev gagsgegfnv
721 nvawaggldp pmgdpeylaa frivvmpiar efspdlvlvs agfdaaeghp aplggyhvsa
781 kcfgymtqql mnlaggavvl alegghdlta icdaseacva allgnrvdpl seegwkqkpq
841 pqchplsggr dpgaq (SEQ ID No: 13)

FIGURE 7A

1 ataataccta ccttgcagga ccacgacagg attaagtgag gaaaaacccc catgagagtg
61 ttttgccatt gtcaagtgag cctgagggag gctgagggggg gatcaggctg tatcatgccc
121 ccgaggacaa actttccagt ttaccctgct ccctctctct gtccctaggc tgccccaggc
181 cctgtgcaga cacaccaggc cctcagccgc agcccatgga cctgcgggtg ggccagcggc
241 ccccagtgga gcccccacca gagcccacat tgctggccct gcagcgtccc cagcgcctgc
301 accaccacct cttcctagca ggcctgcagc agcagcgctc ggtggagccc atgaggctct
361 ccatggacac gccgatgccc gagttgcagg tgggaccccca ggaacaagag ctgcggcagc
421 ttctccacaa ggacaagagc aagcgaagtg ctgtagccag cagcgtggtc aagcagaagc
481 tagcggaggt gattctgaaa aaacagcagg cggccctaga aagaacagtc catcccaaca
541 gccccggcat tccctacaga accctggagc ccctggagac ggaaggagcc acccgctcca
601 tgctcagcag cttttttgcct cctgttccca gcctgcccag tgacccccca gagcacttcc
661 ctctgcgcaa gacagtctct gagcccaacc tgaagctgcg ctataagccc aagaagtccc
721 tggagcggag gaagaatcca ctgctccgaa aggagagtgc gcccccccagc ctccggcggc
781 ggcccgcaga gaccctcgga gactcctccc caagtagtag cagcacgccc gcatcagggt
841 gcagctcccc caatgacagc gagcacggcc ccaatcccat cctgggcgac agtgaccgca
901 ggacccatcc gactctgggc cctcggggggc caatcctggg gagcccccac actcccctct
961 tcctgcccca tggcttggag cccgaggctg gggggcacctt gcctctcgc ctgcagccca
1021 ttctcctcct ggaccccctca ggctctcatg ccccgctgct gactgtgccc gggcttgggc
1081 ccttgcccctt ccactttgcc cagtccttaa tgaccaccga gcggctctct gggtcaggcc
1141 tccactggcc actgagccgg actcgctcag agccctgcc ccccagtgcc accgctcccc
1201 caccgccggg ccccatgcag ccccgcctgg agcagctcaa aactcacgtc caggtgatca
1261 agaggtcagc caagccgagt gagaagcccc ggctgcggca gatacccctcg gctgaagacc
1321 tggagacaga tggcgggggga ccgggccagg tggtggacga tggcctggag cacagggagc
1381 tgggccatgg gcagcctgag gccagaggcc ccgctcctct ccagcagcac cctcaggtgt
1441 tgctctggga acagcagcga ctggctgggc ggctcccccg gggcagcacc ggggacactg
1501 tgctgcttcc tctggcccag ggtgggcacc ggcctctgtc ccgggctcag tcttccccag
1561 ccgcacctgc ctcactgtca gccccagagc ctgccagcca ggcccgagtc ctctccagct
1621 cagagacccc tgccaggacc ctgcccttca ccacagggct gatctatgac tcggtcatgc
1681 tgaagcacca gtgctcctgc ggtgacaaca gcaggcaccc ggagcacgcc ggccgcatcc
1741 agagcatctg gtcccggctg caggagcggg ggctccggag ccagtgtgag tgtctccgag
1801 gccggaaggc ctccctggaa gagctgcagt cggtccactc tgagcggcac gtgctcctct
1861 acggcaccaa cccgctcagc cgcctcaaac tggacaacgg gaagctggca gggctcctgg
1921 cacagcggat gtttgagatg ctgccctgtg gtggggttgg ggtggacact gacaccatct
1981 ggaatgagct tcattcctcc aatgcagccc gctgggccgc tggcagtgtc actgacctcg
2041 ccttcaaagt ggcttctcgt gagctaaaga atggtttcgc tgtggtgcgg cccccaggac
2101 accatgcaga tcattcaaca gccatgggct tctgcttctt caactcagtg gccatcgcct
2161 gccggcagct gcaacagcag agcaaggcca gcaaggccag caagatcctc attgtagact
2221 gggacgtgca ccatggcaac ggcacccagc aaaccttcta ccaagacccc agtgtgctct
2281 acatctccct gcatcgccat gacgacggca acttcttccc ggggagtggg gctgtggatg
2341 aggtaggggc tggcagcggt gagggcttca atgtcaatgt ggcctgggct ggaggtctgg
2401 accccccat ggggggatcct gagtacctgg ctgctttcag gatagtcgtg atgcccatcg
2461 cccgagagtt ctctccagac ctagtcctgg tgtctgctgg atttgatgct gctgagggtc
2521 acccggcccc actgggtggc taccatgttt ctgccaaatg ttttggatac atgacgcagc
2581 aactgatgaa cctggcagga ggcgcagtgg tgctggcctt ggagggtggc catgacctca

2641 cagccatctg tgacgcctct gaggcctgtg tggctgctct tctgggtaac agggtggatc
2701 ccctttcaga agaaggctgg aaacagaaac cccaacctca atgccatccg ctctctggag
2761 gccgtgatcc gggtgcacag taaatactgg ggctgcatgc agcgcctggc ctcctgtcca
2821 gactcctggg tgcctagagt gccaggggct gacaaagaag aagtggaggc agtgaccgca
2881 ctggcgtccc tctctgtggg catcctggct gaagataggc cctcggagca gctggtggag
2941 gaggaagaac ctatgaatct ctaaggctct ggaaccatct gcccgcccac catgcccttg
3001 ggacctggtt ctcttctaac ccctggcaat agcccccatt cctgggtctt tagagatcct
3061 gtgggcaagt agttggaacc agagaacagc ctgcctgctt tgacagttat cccagggagc
3121 gtgagaaaat c (SEQ ID No. 14)

FIGURE 7B

(sheet 2/2)

1 meepeepads gqslvpvyiy speyvsmcds lakipkrasm vhslieayal hkqmrivkpk
61 vasmeematf htdaylqhlq kvsqegdddh pdsieyglgy dcpategifd yaaaiggati
121 taaqclidgm ckvainwsgg whhakkdeas gfcylndavl gilrlrrkfe rilyvdldlh
181 hgdgvedafs ftskvmtvsl hkfspgffpg tgdvsdvglg kgryysvnvp iqdgiqdeky
241 yqicesvlke vyqafnpkav vlqlgadtia gdpmcsfnmt pvgigkclky ilqwqlatli
301 lggggynlan tarcwtyltg vilgktlsse ipdhefftay gpdyvleitp scrpdrneph
361 riqqilnyik gnlkhvv (SEQ ID No:15)

FIGURE 8A

```
   1 gaaattcggc acgagctcgt gccgaattcg gcacgagaac ggttttaagc ggaagatgga
  61 ggagccggag gaaccggcgg acagtgggca gtcgctggtc ccggtttata tctatagtcc
 121 cgagtatgtc agtatgtgtg actccctggc caagatcccc aaacgggcca gtatggtgca
 181 ttctttgatt gaagcatatg cactgcataa gcaaatgagg atagttaagc ctaaagtggc
 241 ctccatggag gagatggcca ccttccacac tgatgcttat ctgcagcatc tccagaaggt
 301 cagccaagag ggcgatgatg atcatccgga ctccatagaa tatgggctag gttatgactg
 361 cccagccact gaagggatat ttgactatgc agcagctata ggaggggcta cgatcacagc
 421 tgcccaatgc ctgattgacg gaatgtgcaa agtagcaatt aactggtctg gagggtggca
 481 tcatgcaaag aaagatgaag catctggttt ttgttatctc aatgatgctg tcctgggaat
 541 attacgattg cgacggaaat ttgagcgtat tctctacgtg gatttggatc tgcaccatgg
 601 agatggtgta gaagacgcat tcagtttcac ctccaaagtc atgaccgtgt ccctgcacaa
 661 attctcccca ggatttttcc caggaacagg tgacgtgtct gatgttggcc tagggaaggg
 721 acggtactac agtgtaaatg tgcccattca ggatggcata caagatgaaa aatattacca
 781 gatctgtgaa agtgtactaa aggaagtata ccaagccttt aatcccaaag cagtggtctt
 841 acagctggga gctgacacaa tagctgggga tcccatgtgc tcctttaaca tgactccagt
 901 gggaattggc aagtgtctta agtacatcct tcaatggcag ttggcaacac tcattttggg
 961 aggaggaggc tataaccttg ccaacacggc tcgatgctgg acatacttga ccggggtcat
1021 cctagggaaa acactatcct ctgagatccc agatcatgag tttttcacag catatggtcc
1081 tgattatgtg ctggaaatca cgccaagctg ccggccagac cgcaatgagc cccaccgaat
1141 ccaacaaatc ctcaactaca tcaaagggaa tctgaagcat gtggtctagt tgacagaaag
1201 agatcaggtt tccagagctg aggagtggtg cctataatga agacagcgtg tttatgcaag
1261 cagtttgtgg aatttgtgac tgcagggaaa atttgaaaga aattacttcc tgaaaatttc
1321 caaggggcat caagtggcag ctggcttcct ggggtgaaga ggcaggcacc ccagagtcct
1381 caactggacc taggggaaga aggagatatc ccacatttaa agttcttatt taaaaaaaca
1441 cacacacaca aatgaaattt ttaatctttg aaaattattt ttaagcgaat tggggagggg
1501 agtattttaa tcatcttaaa tgaaacagat cagaagctgg atgagagcag tcaccagttt
1561 gtagggcagg aggcagctga caggcagggn tngggcctcn ggaccancca ngtggagccc
1621 tgggagagan ggtactgatc ngcagactgg gagg (SEQ ID NO: 16)
```

FIGURE 8B
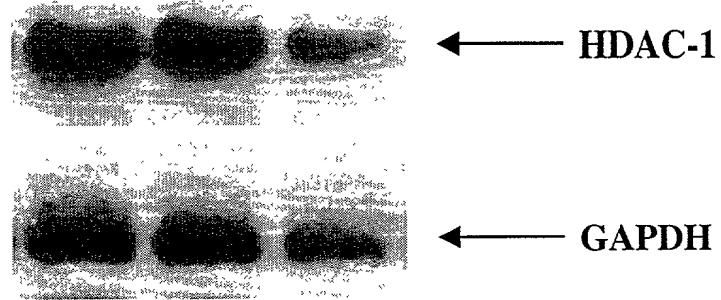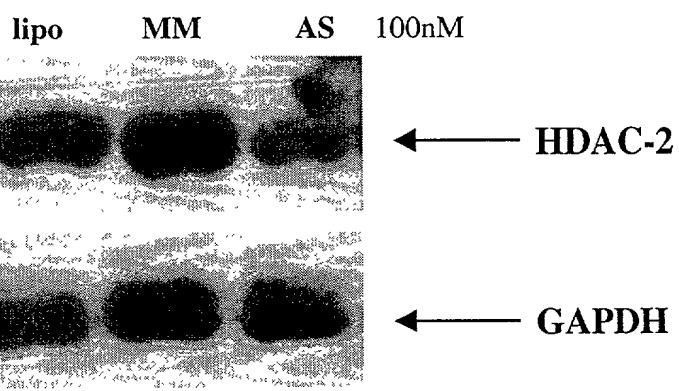
Figure 9A

lipo MM1 AS1 100nM

← HDAC-1

← GAPDH

Figure 9B

lipo MM AS 100nM

← HDAC-2

← GAPDH

Figure 9C

lipo AS MM 100nM

← HDAC-6

← GAPDH

Figure 9 D

Lipofectin

50 nM AS

50 nM MM

HDAC-3

GAPDH

Figure 9 E

Lipofectin

50 nM AS

100 nM AS

100 nM MM

HDAC-4

GAPDH

FIGURE 9 F

	AS2			MM
Lipofectin	50 nM	100 nM	150 nM	150 nM

 ← HDAC4

 ← GAPDH

FIGURE 9 G

HDAC5

lipofectin	AS 50nM	AS 100nM

FIGURE 9 H

HDAC7

lipofectin	AS 50nM

FIGURE 9I

FIGURE 10 A

HDAC-1 →
HDAC-2 →
HDAC-3 →
HDAC-4 →
HDAC-6 →
Actin →

HDAC-6 MM
HDAC-6 AS
HDAC-4 MM
HDAC-4 AS
HDAC-3 MM
HDAC-3 AS
HDAC-2 MM
HDAC-2 AS
HDAC-1 MM
HDAC-1 AS
Lipofectin
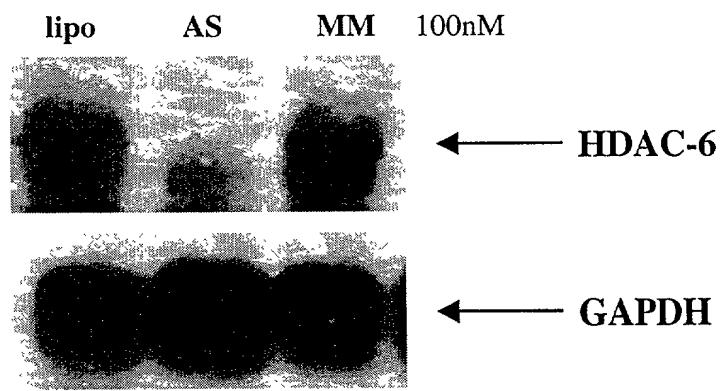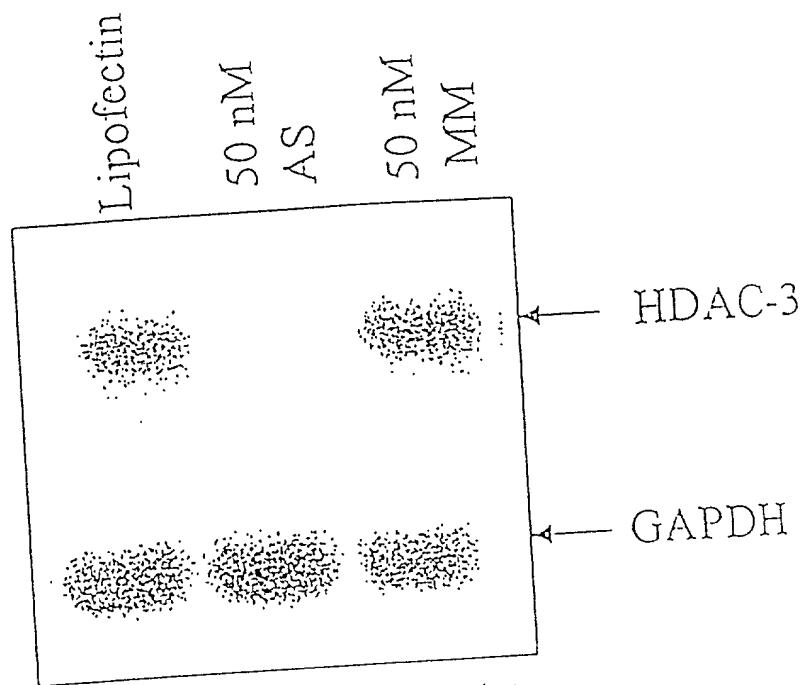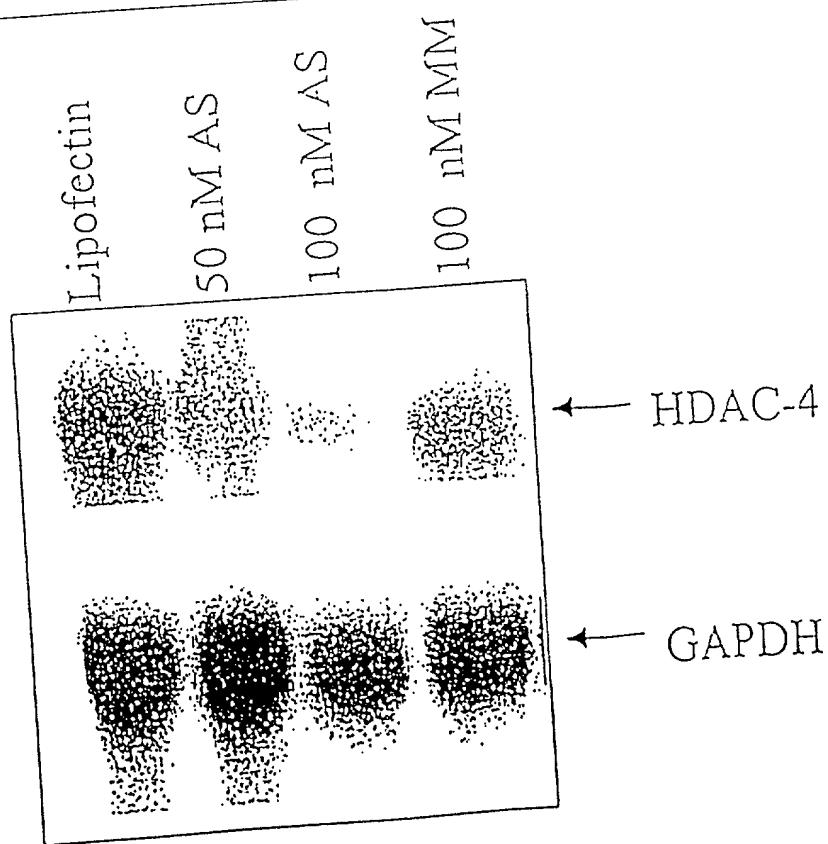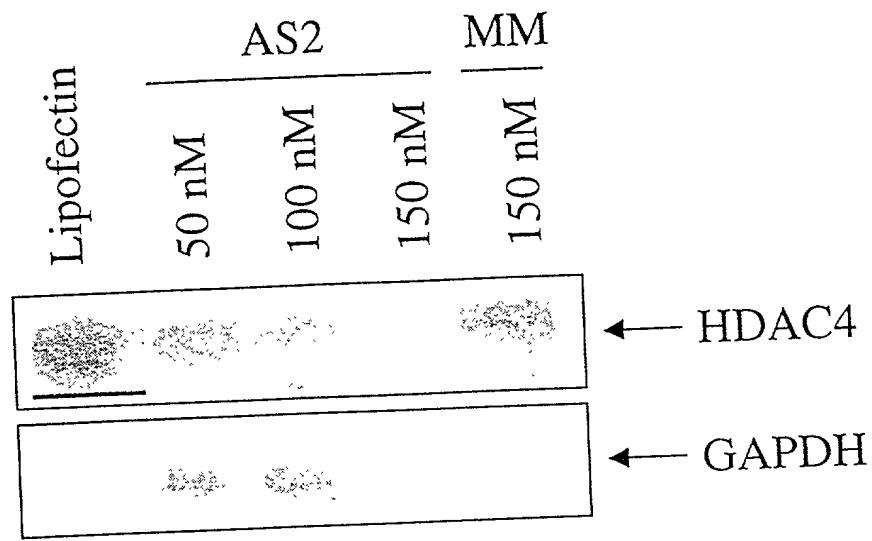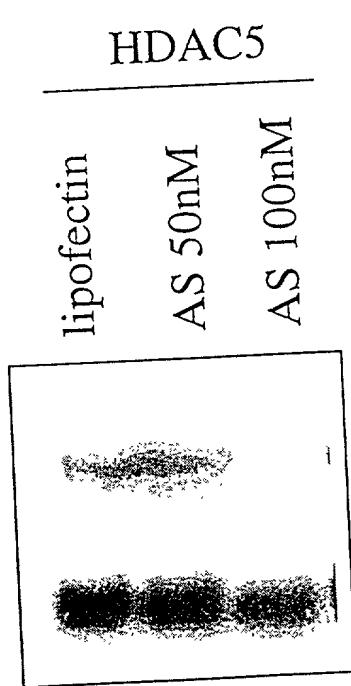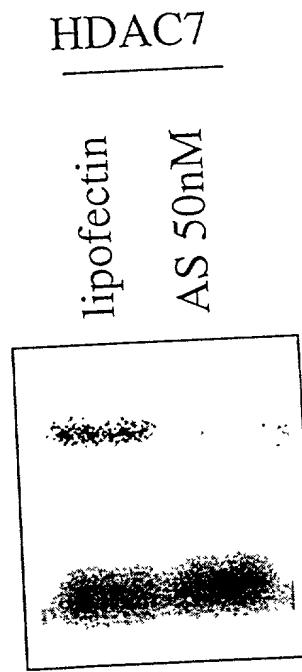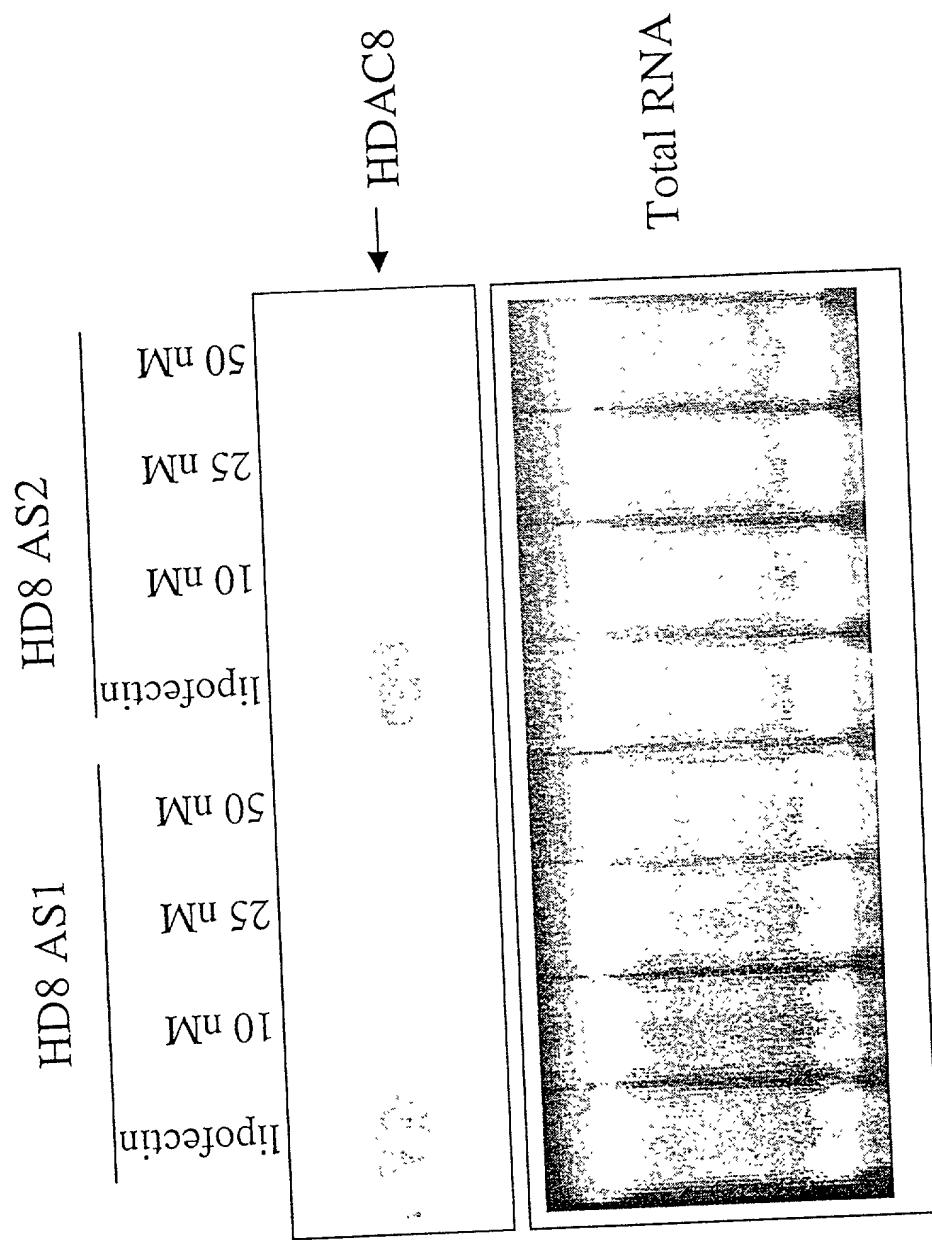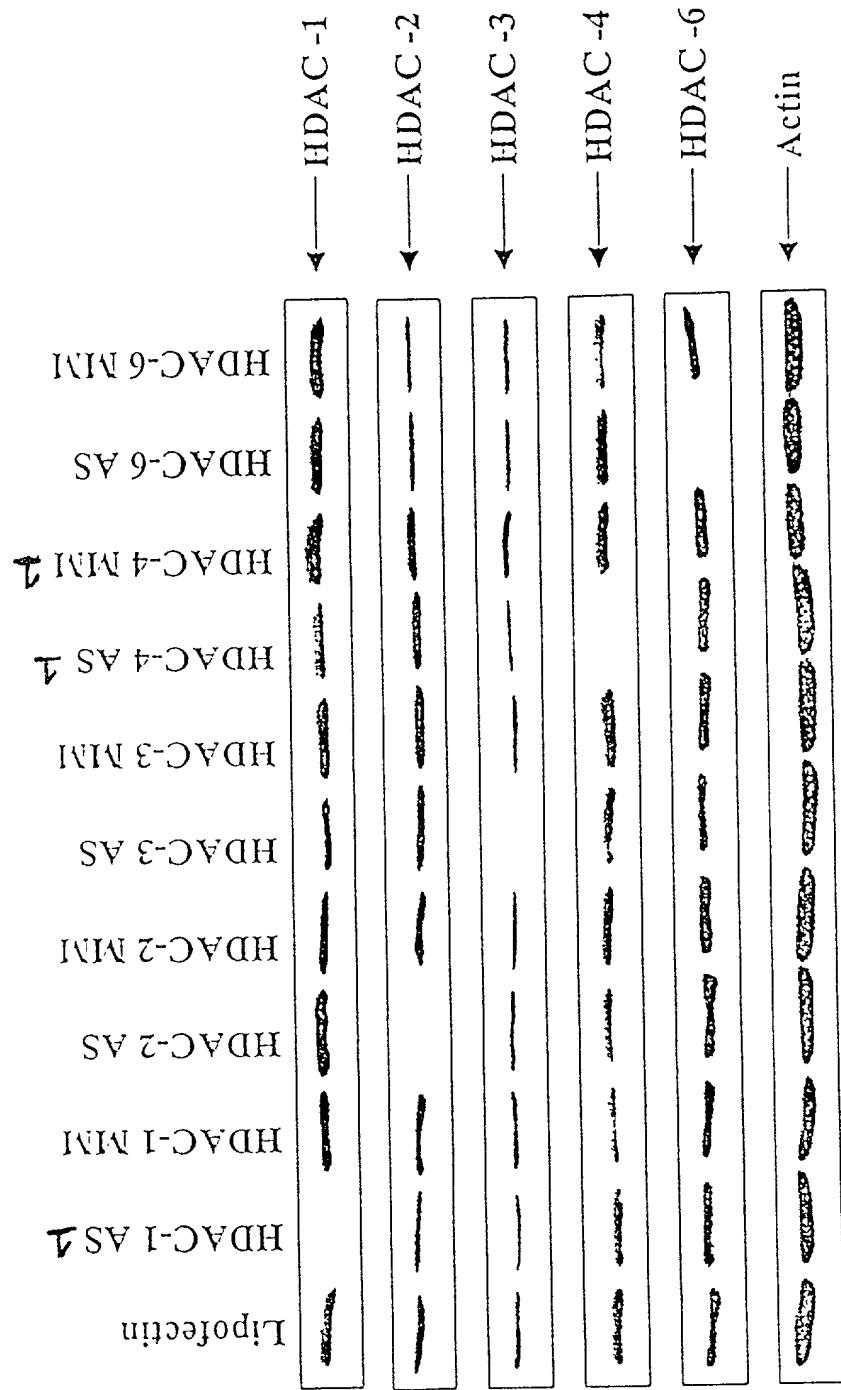
AS = Antisense
MM = Mismatch
NS = Non-specific control
3 day treatment
Oligonucleotide conc. = 50nM

FIGURE 10B

HDAC1
Actin

75 nM MM
50 nM MM
75 nM AS2
50 nM AS2
lipofectin
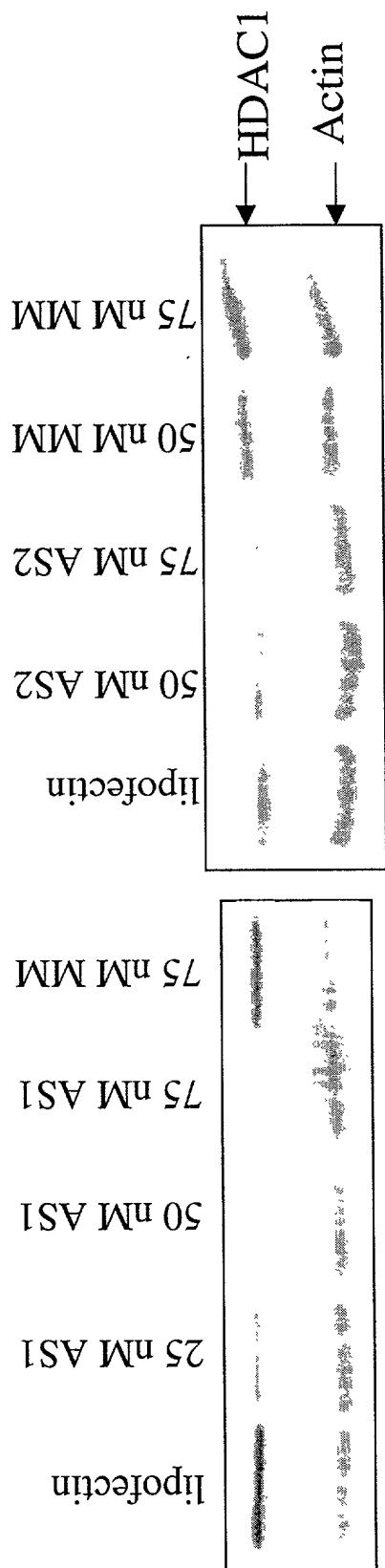
75 nM MM
75 nM AS1
50 nM AS1
25 nM AS1
lipofectin

Figure 11

FIGURE 12A

FIGURE 12B

lipofectin

25 nM AS1

50 nM AS1

75 nM AS1

75 nM MM

lipofectin

50 nM AS2

75 nM AS2

50 nM MM

75 nM MM

Actin ⟶

HDAC1 ⟶

FIGURE 10 B

% of Cells with DNA content (>=2N)
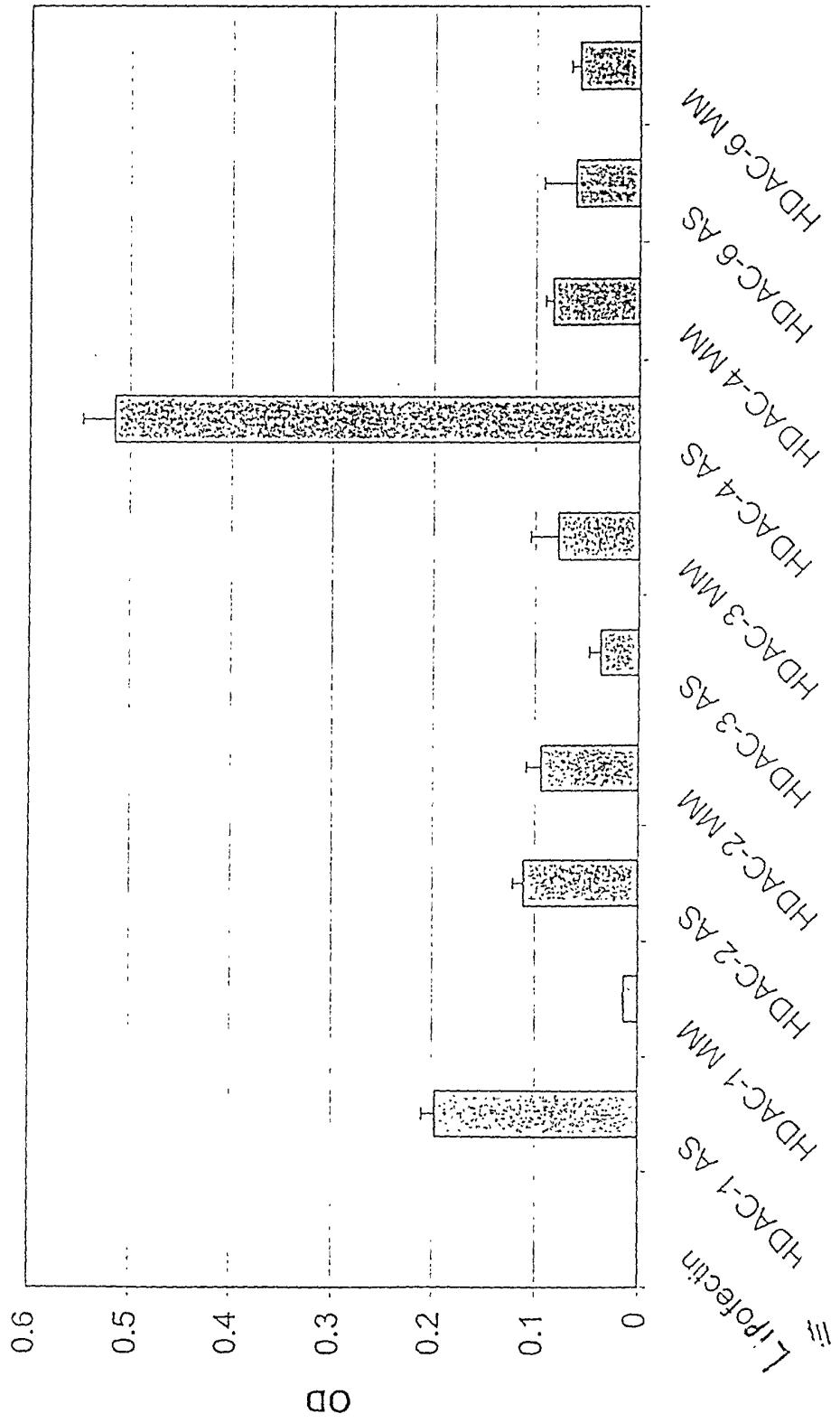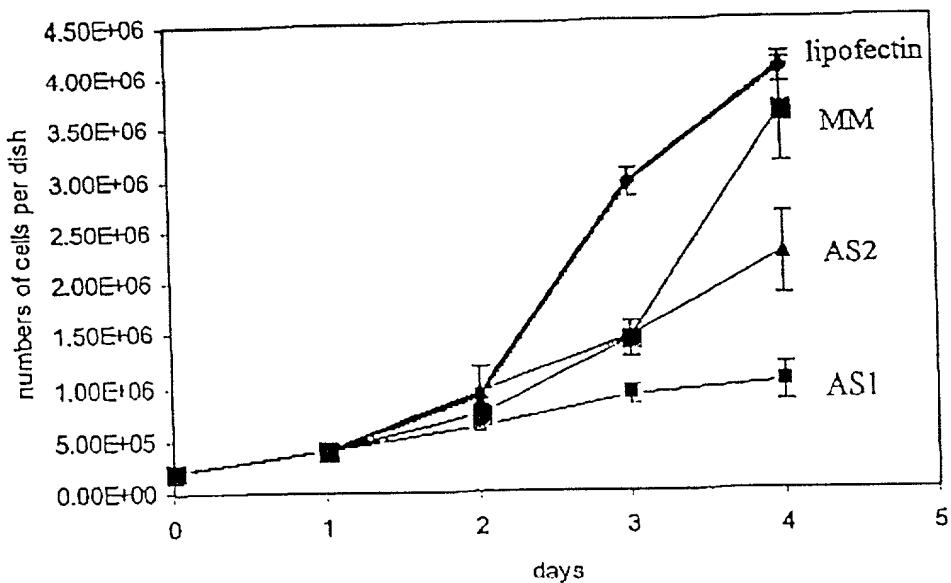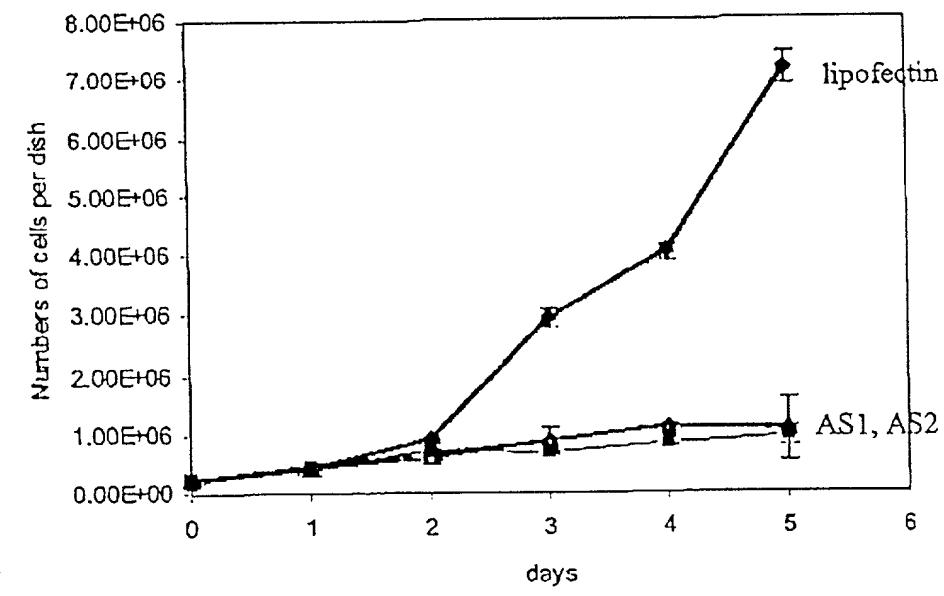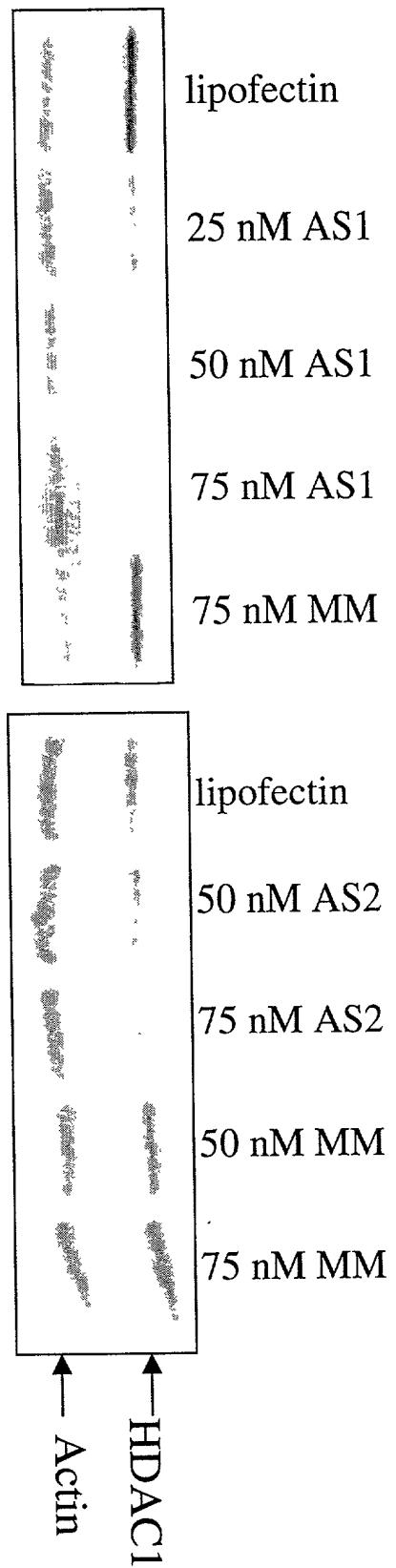
FIGURE 13

FIGURE 14

FIGURE 15

lipofectin | AS MM | AS MM | AS MM | AS MM | AS MM | TSA

HDAC-1 | HDAC-2 | HDAC-3 | HDAC-4 | HDAC-6

← p21

← Actin

FIGURE 16

lipofectin

AS1 50 nM

MM 50 nM

AS2 50 nM

← HDAC1

← Cyclin B1

← Cyclin A

← Actin

Figure 17

(A)

| lipofectin | HDAC-1 AS1 | HDAC-1 MM |

Colony Numbers   ~1200   ~120   ~1160

(B)

| lipofectin | HDAC-1 AS1 | HDAC-2 AS | HDAC-6 AS |

Colony Numbers   ~1200   ~120   ~890   ~730
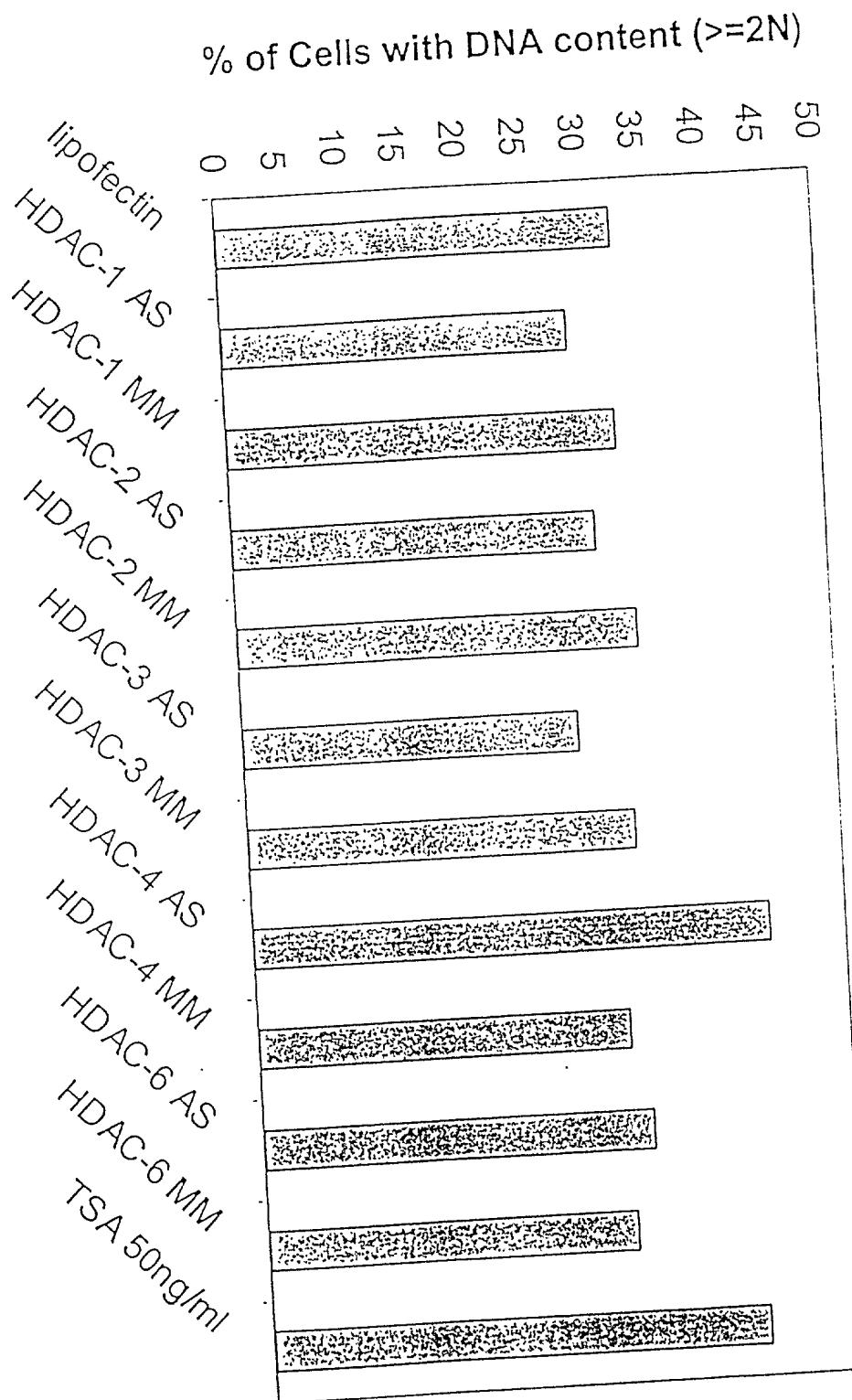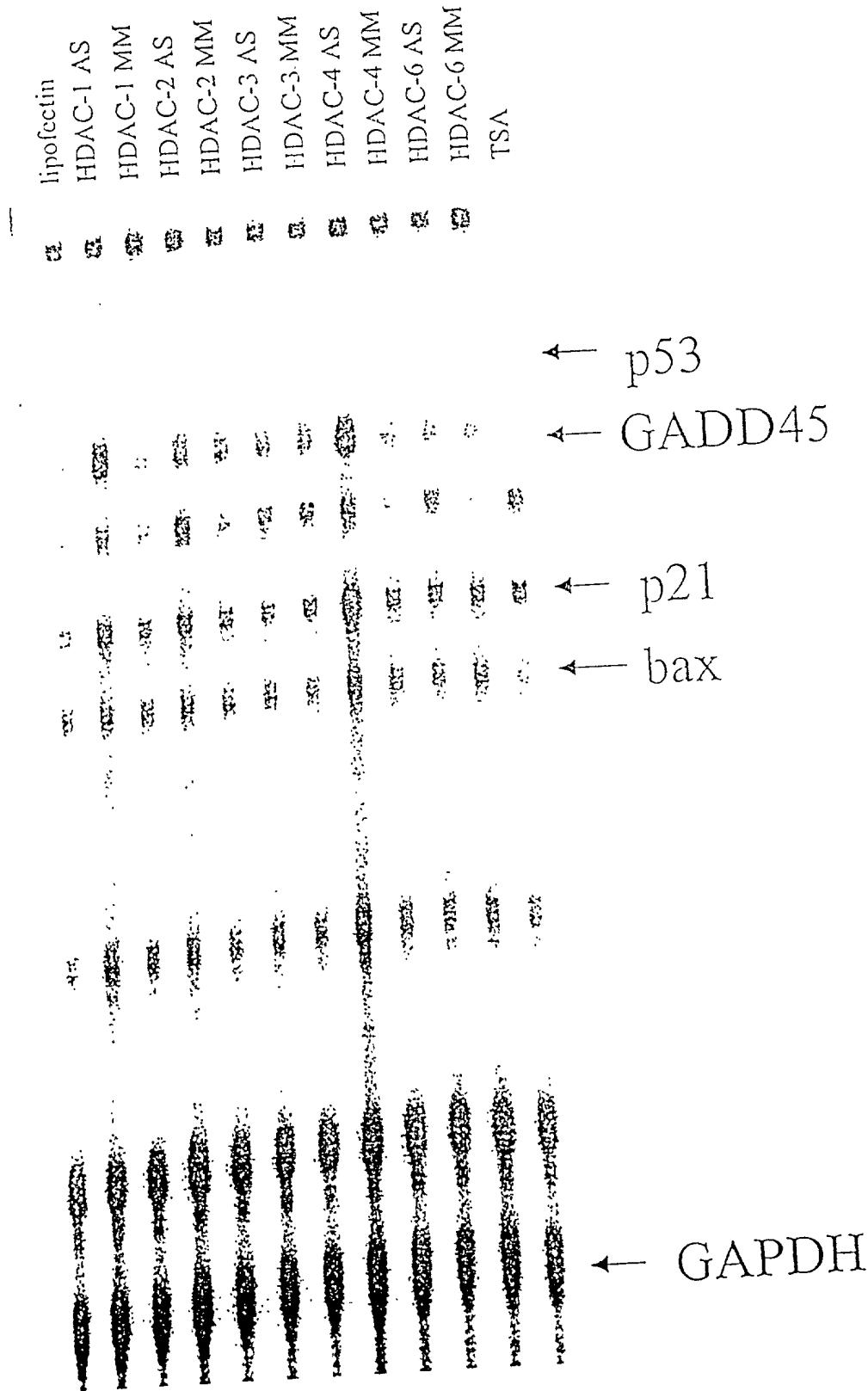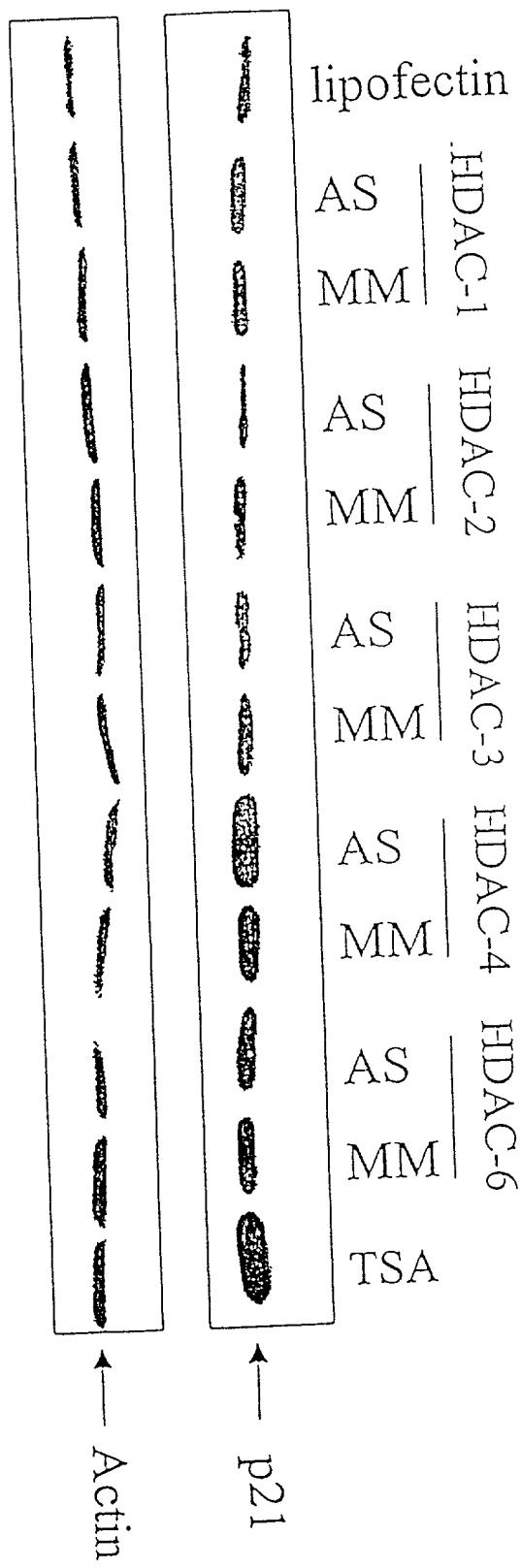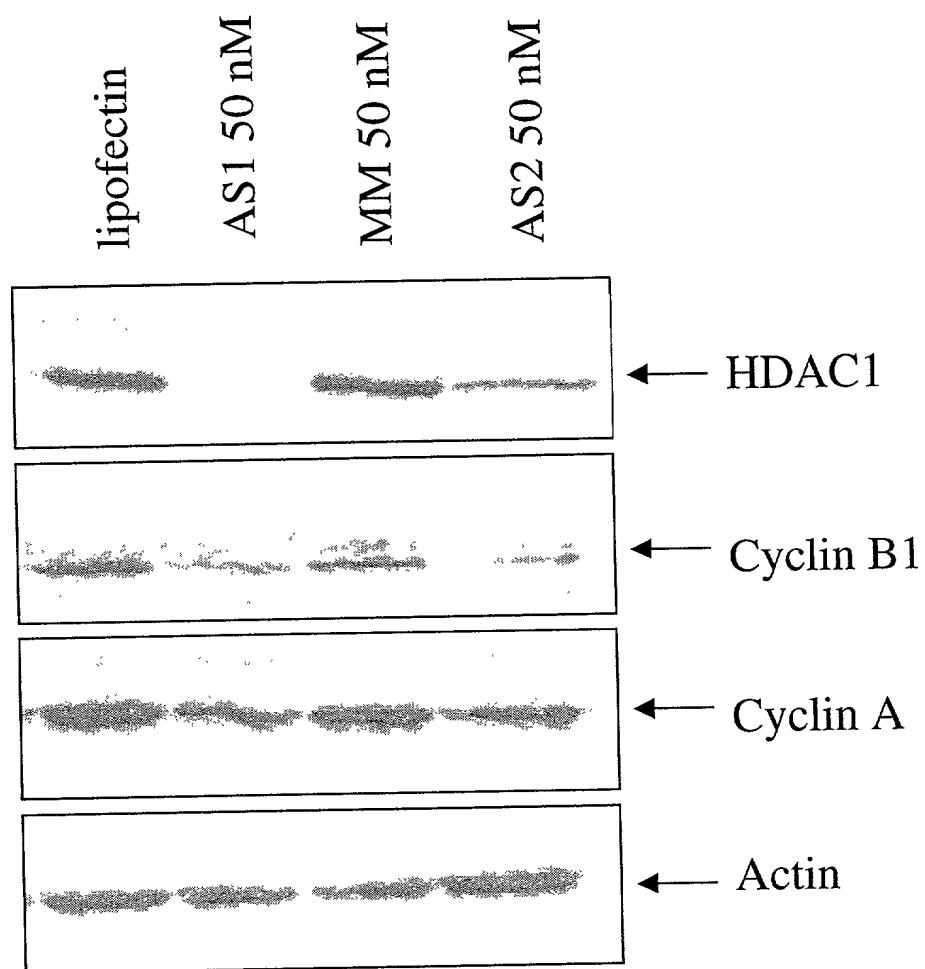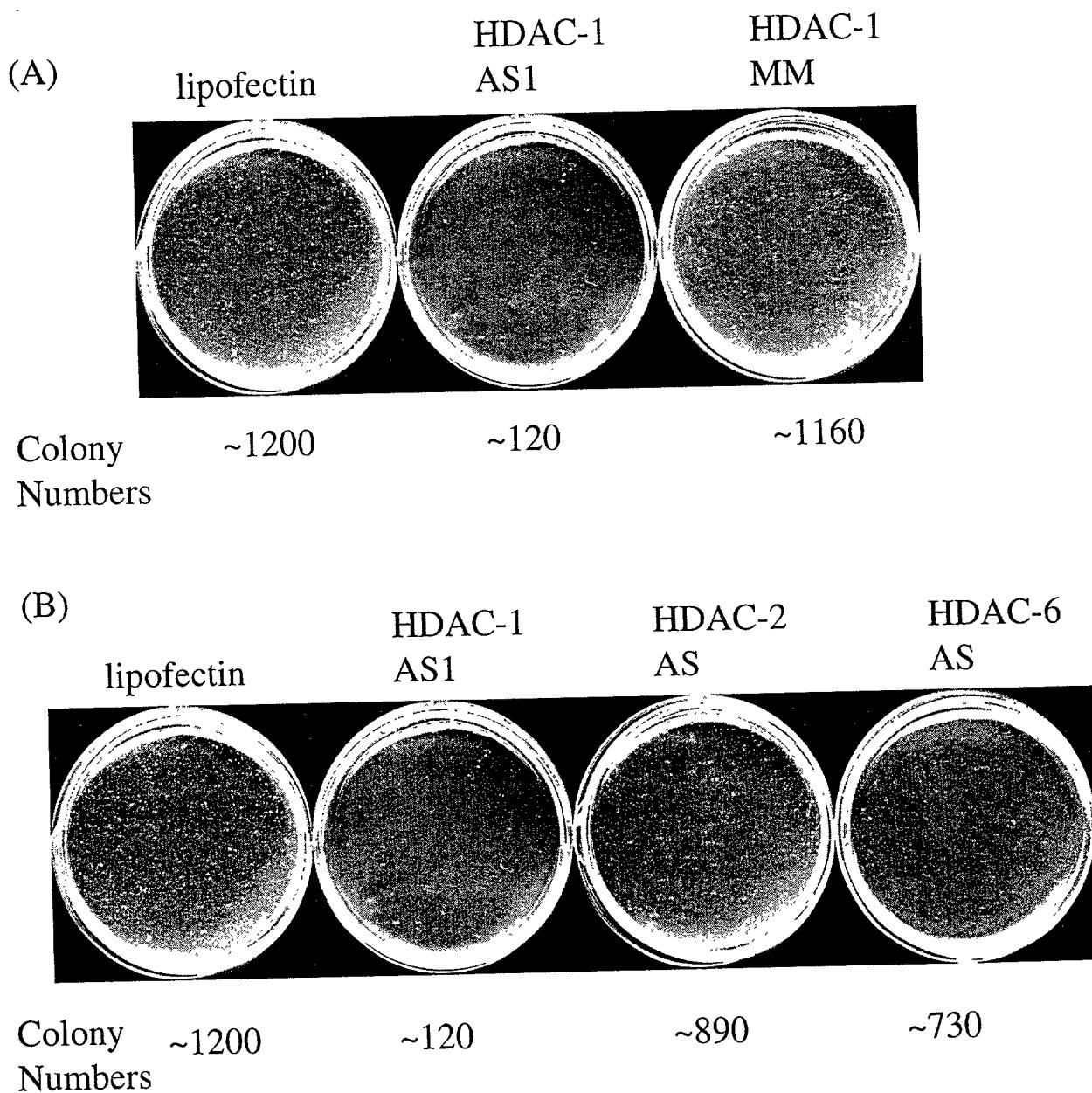
FIGURE 18

Compound 3

0   1   5   25 uM

← p21^{WAF1}

← Cyclin B1

← Cyclin A

← Actin